

Demonstrating cost-effective low energy solutions in Denmark – Results from the Class 1 EU CONCERTO project

Ove Mørck

Cenergia Energy Consultants A/S, Herlev, Denmark

Kirsten Engelund Thomsen

Danish Building Research Institute, SBI, Aalborg University, Hoersholm, Denmark

ABSTRACT: The EU Concerto project commenced in 2007 and involves 5 Member States: Denmark, Estonia, France, Italy and Romania. In Denmark approximately 400 dwellings will be designed and constructed as "low-energy class 1" houses according to requirements set by the Municipality of Egedal. This means that the energy consumption is 50% below the existing energy regulations. Sixty-five dwellings have been constructed with a yearly heating demand of 15 kWh/m². The Concerto community also includes a kindergarten (completed) and a senior citizens centre. The Class 1 project uses these stronger energy requirements to drive the technological development of different components covering 3 areas: Eco-buildings, Renewable Energy Supply and Intelligent Building Energy Management System (BEMS). The technologies cover: windows, slab and foundation insulation systems, biomass gasification, local district heating distribution networks, ventilation heat recovery combined with heat pumps and BEMS. This paper describes the status of the project preliminary results and developments.

1 PROJECT OBJECTIVES

1.1 Introduction

The intention of the project Class 1 is to use the strengthening of the energy requirements to boost and drive the technological developments and to prove the economic and environmental benefits of ultra-low energy buildings (50% below the new requirements in the Danish Building Regulations) integrated with a renewable energy supply based on biomass and solar heating. The Class 1 project focuses on the optimisation of sustainable energy systems in local communities through an innovative integration of Renewable Energy technologies with ultra-low-energy buildings.

The project also puts special focus on the Indoor Environmental Quality (IEQ) to make sure that the energy savings are met without reducing the IEQ standards set out in the design specification phase. The IEQ focus is one of the areas in which the Class 1 project involves partners from other EU member states (MS) who are experts in lighting and thermal comfort issues. Also trans-national cooperation is introduced for the socio-economic research part of the project, which deals with the user point of view (priorities, etc.) in the participating MS.

The Class 1 project demonstrates improvements within 6 individual technologies (windows, slab and foundation insulation systems, biomass gasification, local district heating distribution networks, ventilation heat recovery combined with heat pumps and BEMS) and an innovative integration of these technologies (with solar heating) which leads to improved cost effectiveness.

1.2 Objectives

There are 5 scientific, technical and "political" objectives of the Class 1 project: